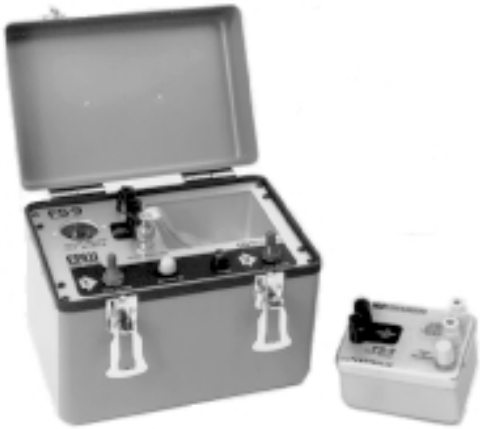
FS-9 Firing System



DESCRIPTION

The FS-9 portable firing system is designed for use in blasting operations and in conjunction with RISI EBW (Exploding BridgeWire) Detonators. The system includes a Control Unit (P/N 188-7211) and a Firing Module (P/N 167-8502). The system fires automatically when the module reaches 3000 volts.

DESIGN AND SPECIFICATIONS

Input Energy
- Battery supply for a minimum of 100 firings
- Built-in battery charger for 110 VAC (220 available).

Output Energy
- 3000 volt pulse with 1000 amperes peak current into low resistance load. (4.5 joules).

Circuit
- Regulated DC battery power supply in Control Unit
- DC to DC converter with high voltage energy storage capacitor in firing module.

Control Unit Input Connection
- U.S. Type, 3 pin plug for 110 VAC battery recharging.

Control Unit
- Shorting Plug
- Dual switches for firing
- Ready-to-fire lamp indicator
- Internal batteries
- Battery charger

Control Unit to Module Connection
- Maximum of 2500 feet of 20 gauge twin conductor wire, P/N 167-8559.

Module
- Five-way binding posts
- Voltage converter
- Automatic trigger
- Internal discharge
- External shorting capability
- Exterior dimensions: 3”x3”x4”

Module to Detonator Connection
- Maximum 100 feet twin lead blasting wire (P/N 167-8559) or 300 feet Type “C” high voltage coaxial cable (P/N 167-2669).

Options
- FS-40 Ruggedized Module (P/N 188-7071)
- FS-40 Underwater Module (P/N 188-7117)

FS-9 Operation Discussion

The purpose of the FS-9 Control Unit is to provide low voltage electrical energy to the Firing Module and to ensure a safe and reliable operation sequence for the firing of EBW detonators.

The output from the Control Unit to the firing module is 40 volts when the batteries are fully charged. This output occurs when both the “Hold-to-Arm” and “Hold-to-Fire” buttons are simultaneously pressed and the shorting plug is mated into the Control Unit “Safety Interlock” connection. The “Battery OK” lamp will illuminate when the “Hold-to-Arm” button is pressed, providing the batteries are above 32 volts. When the “Hold-to-Fire” button is pressed in conjunction with the “Hold-to-Arm” button, the voltage is then applied to the output terminals and the “Ready” lamp will illuminate. At this time the Firing Module, if connected, will begin arming and automatically fire within a few seconds. Should the operator wish to abort the firing while arming is taking place, merely release one or both the “Hold-to-Arm” or “Hold-to-Fire” buttons before detonation of the EBW detonator occurs.

The purpose of the FS-9 Firing Module is to provide a significant amount of flexibility to this EBW detonator firing system. Since the firing pulse to function the EBW detonator must be applied at the proper rate of rise, or frequency, the Firing Module must be placed relatively close to the detonator. By being able to separate the Firing Module from the Control Unit, the operator can perform the detonation at extended distances as required by the size and characteristics of the main explosive charge. The unit has an external shorting capacity across the energy storage capacitor by using the same connector or shorting plug as used at the Control Unit “Safety Interlock” connection. There is a safety circuit that allows only one firing of the module each time power is applied.

The input to the FS-9 Firing Module must be between 32 and 40 volts. This input charges a one microfarad capacitor. When this energy storage capacitor reaches 3000 volts, it is discharged automatically across the “To EBW Detonator Only” terminals of the firing module.

By mating the shorting plug to the “Discharge” connector the energy storage capacitor is completely and immediately discharged thus precluding inadvertent arming of the firing module and detonation of the EBW detonator.

Caution: While EBW detonators are inherently less susceptible to accidental detonation during handling and set-up than devices containing primary explosives, electrical and electronic firing systems are sensitive to transient electrical energies which could cause premature triggering or firing. The blasting area must be clear of personnel and equipment before the detonator leads are connected to the FS-9 Firing System or any other RISI Firing System. Only approved RISI Firing Systems should ever be used to initiate or detonate any explosive product manufactured and authorized for sale by RISI.